

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

n re Patent Application of

Nathan S. Lewis et al.

Application No.: 10/017,221

Filed: December 13, 2001

For:

METHOD AND SYSTEM FOR

DETERMINING ANALYTE ACTIVITY

Group Art Unit: 1753

Examiner: ALEXANDER NOGUEROLA

Confirmation No.: 9894

Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail, on September 12, 2005 and is addressed to the Commissioner for Patents. P.O. Box 1450, Alexandria, VA 22313-1450.

oseph R. Baker, Jr.

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure as set forth in 37 C.F.R. § 1.56, the accompanying information is being submitted in accordance with 37 C.F.R. §§ 1.97 and 1.98.

Pursuant to 37 C.F.R. § 1.98, a copy of each of the documents cited is enclosed. Pursuant to 37 C.F.R. § 1.98, a copy of each of the documents cited is enclosed. However, copies of the listed U.S. patents and U.S. patent application publications are not enclosed since it is no longer required according to the July 11, 2003 waiver of the requirement for copies of cited U.S. patents and U.S. patent application publications.

The documents are being submitted after a first Office Action on the merits but prior to the closing of prosecution, therefore under 37 C.F.R. § 1.97(c), the fee set forth in 37 C.F.R. § 1.17(p) is enclosed.

To assist the Examiner, the documents are listed on the attached form PTO-1449. It is respectfully requested that an Examiner initialed copy of this form be returned to the undersigned.

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BUCHANAN INGERSOLL PC

Respectfully submitted,

Date September 12, 2005

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Substitute for form 1449A/PTO & 1449B/PTO Complete if Known **Application Number** 10/017,221 INFORMATION DISCLOSURE December 13, 2001 STATEMENT BY APPLICANT Filing Date First Named Inventor Nathan S. Lewis et al. **Examiner Name** Alexander Noguerola 6 Bee of 5 **Attorney Docket Number** 034345-091

SEP 1 5 2	005 B		U.S. PATENT DOCUMENTS	
Examiner Initials CARAD	1 /4/	Kind Code (if known)	Name of Patentee or Applicant of Cited Document	Issue/Publication Date (MM-DD-YYYY)
Senant .	6,844,197		Doleman et al.	01-18-2005
an	6,841,391		Lewis et al.	01-11-2005
M	6,773,926		Freund et al.	08-10-2004
CM	6,759,010		Lewis et al.	07-06-2004
Th	6,752,964		Grubbs et al.	06-22-2004
M	6,631,333		Lewis et al.	10-07-2003
X	6,610,367		Lewis et al.	08-26-2003
On	6,571,603		Doleman et al.	06-03-2003
(11)	6,537,498		Lewis et al.	03-25-2003
00	6,495,892		Goodman et al.	12-17-2002
an	6,467,333		Lewis et al.	10-22-2002
DIN	6,455,319	•	Lewis et al.	09-24-2002
an	6,387,329		Lewis et al.	05-14-2002
The same	6, 331,244		Lewis et al.	12-18-2001
17m	6,319,724		Lewis et al.	11-20-2001
MA	6,305,214		Schattke et al.	10-23-2001
1717	6,244,096		Lewis et al.	06-12-2001
Xn	6,028,608		Jenkins	02-22-2000
(An	6,007,775		Yager	12-28-1999
an	5,948,684		Weigl et al.	09-07-1999
011	5,928,609		Gibson et al.	07-27-1999
a	5,913,235		Silenius et al.	06-15-1999
(XIA	5,832,411		Schatzmann et al.	11-03-1998
Ž٧	5,807,701		Payne et al.	09-15-1998
97	5,627,329		Krishnan et al.	05-06-1997
OW	5,591,898		Mayer	01-07-1997
(X) .	5,469,369		Rose-Phersson et al.	11-21-1995
an	5,415,893		Wiersma et al.	05-16-1995
XX	5,278,501		Guilfoyle	01-11-1994
an	5,212,447		Pattiel	05-18-1993
ON	4,946,562		Guruswamy	08-07-1990
an	4,914,608		LeBihan et al.	04-03-1990
CIM	4,424,487		Lauffer	01-03-1984
0	3,677,071		Martin	07-18-1972
an	20040147038		Lewis et al.	07-29-2004
JA	20040042933		Lewis et al.	03-04-2004
an	20040033165		Lewis et al.	02-19-2004
an An	20030159927		Lewis et al.	08-28-2003
in	20030136960		Goodman et al.	07-24-2003
20	20020197390		Lewis et al.	12-26-2002
27	20020192117		Lewis et al.	12-19-2002
In	20020143477		Lewis et al.	10-03-2002
an	20020141901		Lewis et al.	10-03-2002
Cal	20020081232		Lewis et al.	06-27-2002
Our -	20020017125		Lewis et al.	02-14-2002
Žn -	20020005580		Goodman et al.	01-17-2002
an	20010041366		Lewis et al.	11-15-2001

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*EXAMINER: Initial if reference considered whether or not citation is in conformance with M.P.E.P. § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

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Substitute for form 1449A/PTO & 1449B/PTO	Complete if Known		
INFORMATION DISCLOSURE	Application Number	10/017,221	
STATEMENT BY APPLICANT	Filing Date	December 13, 2001	
	First Named Inventor	Nathan S. Lewis et al.	
3.0	Examiner Name	Alexander Noguerola	
Sheet 2 of 5	Attorney Docket Number	034345-091	

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\$EP 1 5 2005 W		(يو ١	FOREIGN PATENT DOCUMENTS									
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% .	PADE STATE OF THE PARTY OF THE	Document Number	Kind Code (if known)	Country	Date of Publication (MM-DD-YYYY)	Translation	Partial Translation	Eng. Lang. Summary	Search Report	IPER	Abstract	Cited in Spec
	CIA	3728452A	\1	DE	03-09-1989						X	
	Ch	0 794 428/	A1	EP	10-09-1997							
	MM	61-00303	9	JP	01-09-1986						X	
	CK	04-00295	8	JP	01-07-1992						X	
	DIV	08-26403	8	JP	10-11-1996						X	

	NON-PATENT LITERATURE DOCUMENTS
Examiner Initials	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
an	Barisci et al., "Conducting Polymer Sensors," TRIP, Vol. 4, No. 9, pp. 307-311 (September 1996)
an	Weherns et al., Calibration of an array of voltammetric microelectrodes," Analytica Chemica Acta., No. 334, pp. 93-101, 1996
an	Williams et al., "Resolving combustible gas mixtures using gas sensitive resistors with arrays of electrodes," J. Chem. Soc., Faraday Trans., Vol. 92, No. 22, pp. 4497-4504, 1996
an	Shurmer et al., "Integrated Arrays of Gas Sensors Using Conducting Polymers with Molecular-Sieves," Sensors and Actuators, Vol. 4, pp. 29-33, 1991
On	Slater et al., "Examination of Ammonia Poly(Pyrrole) Interactions by Piezoelectric and Conductivity Measurements," Analyst, Vol. 116, pp. 1125-1130, November, 1991.
an	Grate et al., "Acoustic-wave microsensors," <u>Anal. Chem., Vol. 65, No. 22, pp. A987-A996, November 15, 1993</u>
an	Grate et al., "Acoustic-wave microsensors," Anal. Chem., Vol. 65, No. 21, pp. A940-A948, November 1, 1993
an	Cornila et al., "Capacitive sensors in CMOS technology with polymer coating," <u>Sensors and Actuators</u> , Vol., 25, pp. 357-361, 1995
an	Johnson et al., "Identification of multiple analytes using an optical sensor array and pattern recognition neural network," Anal. Chem., Vol. 69, No. 22, pp. 4641-4648, November 15, 1997
an	Dickinson et al., "A chemical-detecting system based on a cross-reactive optical sensor array," <u>Nature</u> , Vol. 382, pp. 697-700, August, 1996
an	White et al., "Rapid analyte recognition in a device based on optical sensors and the olfactory system," Anal. Chem., Vol. 68, No. 13, pp. 2191-2202, July 1, 1996
an	Table of Contents Harsanyi, "Polymer films in sensor applications," Technomic Publishing Co., Inc., Lancaster, 1995
an	Albert et al., "Cross-Reactive Chemical Sensor Arrays," <u>Chem. Rev.,</u> Vol. 100, No. 7, pp. 2595-2626, 2000
Ga	Doleman et al., "Use of compatible polymer blends to fabricate arrays of carbon black-polymer composite vapor detectors," Anal. Chem., Vol. 70, No. 13, pp. 2560-2564, July 1, 1998.
an	Benes et al., "Sensors based on piezoelectric resonators," <u>Sensors and Actuators</u> , Vol. A48, No. 1, pp. 1-21, 1995
an	Grate et al., "Surface acoustic-wave vapor sensor based on resonator devices," Anal. Chem., Vol. 63, No. 17, pp. 1719-1727, September 1, 1991
an	Briglin et al., "Progress in use of carbon black-polymer composite vapor detector arrays for land mine detection," <u>Proc. SPIE-Int. Eng.</u> , Vol. 4038, Part One of Two Parts, pp. 530-538, April 24-28, 2000, Orlando, Florida, USA

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Substitute for form 1449	A/PTO & 14	488/PTO		Complete if Known		
INFOR	ITAMS	ON DI	SCLOSURE	Application Number	10/017,221	
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40	•	-		Examiner Name	Alexander Noguerola	
Sheef	3	of	5	Attorney Docket Number	034345-091	

SEP 1 5 2005 **NON-PATENT LITERATURE DOCUMENTS** Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. Wilmshurt, "Signal recovery from noise in electronic instrumentation," Adam Hilger Ltd. Boston, pp. 60-68, Larry et al., "Thick-film technology: An introduction to the materials," IEEE Transactions on Components, Hybrids, and Manufacturing Technology, Vol. CHMT-3, No. 2, pp. 211-225, June, 1980 Weissman et al., "1/f noise and other slow, nonexponential kinetics in condense matter," Rev. Mod. Phys, Vol. 60, No. 2, pp. 537-571, April 1988 Dziedzic et al, 1/f noise I polymer thick-film resistors," <u>J. Phys. D-Appl. Phys.</u>, Vol. 31, pp. 2091-2097, 1998 Scofield et al., "Exclusion of temperature fluctuations as the source of 1/f noise in metal films," Phys. Rev., Vol. 24, No. 12, pp. 7450-7453, December 15, 1981 Fu et al., "Electrical characteristics of polymer thick film resistors, Part I: Experimental results," IEEE Transactions on Components, Hybrids, and Manufacturing Technology, Vol. 4, No. 3, pp. 283-288, September 1981 Deen et al., "Low frequency noise in heavily doped polysilicon thin film resistors," J. Vac. Sci. Technol., Vol. 16, No. 4, pp. 1881-1884, July/August 1998 Severin et al., "Relationships among resonant frequency changes on a coated quartz crystal microbalance, thickness changes and resistance responses of polymer-carbon black composite chemiresistors." Anal. Chem., Vol. 72, No. 9, pp. 2008-2015, May 1, 2000. Peled et al., "1/f noise I bismuth ruthenate based thick-film resistors," IEEE Transactions on Components, Packaging, and Manufacturing Technology, Part A20, Vol. 20, No. 3, pp. 355-360, September 1997 Tayle of Content Horowitz et al., "The Art of electronics," 2nd ed. Cambridge University Press, Cambridge, 1989 Lu, "Applications of piezoelectric quartz crystal microbalances," pp. 19-61, Elsevier, New York, 1984 De Lacy Costello et al., "Novel composite organic-inorganic semiconductor sensors for the quantitiative detection of target organic vapours," J. Matter. Chem., Vol. 6, No. 3, pp. 289-294 (1996) Wampler, "Composites of polypyrrole and carbon black: Part III. Chemical synthesis and characterization," J. Matter. Res., Vol. 10, No. 7, pp. 1811-1822, July 1995. Hongshi et al., "Preparation and characterization of polyaniline-palladium composite films," Mat. Res. Soc. Symp. Proc., Vol., 369, pp. 581-585, (1995) Yassar et al., "Preparation and electroactivity of poly(thiophene) electrodes modified by electrodeposition of palladium particles," J. Electroanal, Chem., Vol. 255, pp. 53-69, 1988 Grimshaw et al., "Redox behaviour of polypyrrole films containing naphthoquinone and benzoquinone groups," J. Electroanal. Chem., Vol. 281, pp.125-132 (1990) lyoda et al., "The 100-A-order depth profile control of polypyrrole-poly(3-methylthiophene) composite thin film by potential-programmed electropolymerization," J. Phys. Chem., Vol. 95, No. 13, pp. 5215-5220, (1991)Dogan et al., "Conducting polymers of aniline II. A composite as a gas sensor," Synthetic Metals, Vol. 60, pp. 27-30, (1993) Elibol et al., "Kinetic studies in the electroinitiated polymerization of N-vinylcarbozole and related conducting polymer composites," J.M.S. - Pure Appl. Chem. Vol. A31, No. 5, pp. 593-611, (1994) Huang et al., "Coating of uniform inorganic particles with polymers," J. Colloid. And Inter. Sci., Vol. 170, pp. 275-283, (1995) Selampinar et al., "A conducting composite of polypyrrole II. As a gas sensor," Synth. Metals, Vol. 68, pp. 109-116, (1995) Hepel et al., "Effect of the composition of polypyrrole substrate on the electrodeposition of copper and nickel," J. Electrochem. Soc., Vol. 143, No. 2, pp. 498-505, February, 1996 Collins et al., "Conductive polymer-coated fabrics for chemical sensing," Synth. Metals, Vol. 78, pp. 93-101, (1996)

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Substitute for form 1449A/PTO 8 1449B/PTO	Complete if Known			
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EP 1 5 2005 **NON-PATENT LITERATURE DOCUMENTS** Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. Rajeshwar et al., "Carbon black and carbon black-conducting polymer composites for environmental applications," Preprints of papers - American Chemical Society, Division of Fuel Chemistry, Vol. 41, pp. 498-502, (1996) Bozkurt et al., "Conducting polymer composites of polypyrrole and polyindene," Synth. Metals, Vol. 82, pp. 41-46, (1996) Talu et al., "Electrochemical copolymerization of thiophene and aniline," J. of Polymer Sci., Part A: Polymer Chemistry, Vol. 34, pp. 2981-2989, (1996) Gibson et al., "Biomimicry of smell using organic electroconductive polymer sensor arrays: Applications in an electronic nose," Polymeric Materials Sci. and Eng., Vol. 76, pp. 515-516, (1997) Gibson et al., "Detection and simultaneous identification of microorganisms from headspace samples using an electronic nose," Sensors and Actuators B, Vol. 44, pp. 413-422, (1997) PP-59,63,66
EDN, "Design Feature: Electronic Olfactory Sensors," Ed. Jim Lipman, pp. 59-64, December 17, 1998 George et al., "Progress on Determining the Vapor Signature of a Buried Landmine," SPIE, Vol. 3710, pp. 258-269, April 1999 La Grone et al., "Landmine Detection by Chemical Signature: Detection of Vapors of Nitroaromatic Compounds by Fluorescence Quenching of Novel Polymer Materials," SPIE, Vol. 3710, pp. 409-420, April Zeller et al., "Establishing a Limit of Recognition for a Vapor Sensor Array, Anal. Chem, 70(19):4191-4201, 1998 Patrash et al., "Characterization of Plymeric Surface Acoustic Wave Sensor Coatings and Semiempirical Models of Sensor Responses to Organic Vapors," Anal. Chem., 65(15):2055-2066, August 1, 1993 Severin et al., "An Investigation of the Concetrnation Dependence and Response to Analyte Mixtures of Carbon Black/Insulating ORganic Polymer COmposite Vaprot Detectors," Anal. Chem., 72(4): 658-668, February 15, 2000 Doleman et al., "Trends in odor intensity for human and electronic noses: Relative roles of odorant vapor pressure vs. molecularly specific odorant binding," Proc. Natl. Acad. Sci. USA, 95:5442-5447, May 1998 Galal, "Electrocatalytic oxidation of some biologically important copunds at conducting olymer electrodes modified by metal complexes," J. Solid State Electrochem., 2:7-15, 1998 Sestak et al., "Selective hydrogen sensors based on Conducting Polymers," SPIE, Vol. 3241, pp. 118-129, Fourrier-Lamer et al., "Studies of semiconducting organic polymer-graphite composites from D.C. to microwave frequencies," Synthetic Metals, Vol. 24, pp. 95-105, 1988 Maxfield et al., "Composite Electrodes Containing Conducting Polymers and Li Alloys," J. Electrochemi. Soc.: Electrochemical Science and Technology, 135(2):299-305, February 1988 Reynolds et al., "Opitical Absorption, Luminescence, and Redox Switching Properties of Polyphenylene Derivatives," Mat. Res. Soc. Symp. Proc., Vol. 328, pp. 191-195, 1994 Frackowiak et al., "Interaction Between Electroconducting Polymers and C60," J. Phys. Chem Solids, 57(6-8):983-989, 1996 Toppare, "Synthesis and characterization of conducting polymers and their composites," Tr. J. of Chemistry, Vol. 21, pp. 30-34, 1997 De Wit et al., "Application of Poly(thienylene vinylene) as a chemiresistor for organic Vapours," Synthetic Metals, Vol. 85, pp. 1303-1304, 1997 Talaie, "Conducting polymer based pH detector: a new outlook to pH sensing technology," Polymer, 38(5):1145-1150, 1997 Kuwabata et al., "Charge-Discharge Properties of Composite Films of Polyaniline and Crystalline V2O5 Particles," J. Electrochem. Sco., 145(8):2707-2710, August 1998 Torsi et al., "Conducting polymers doped with metallic inclusions: New materials for gas sensors," Sensors and Actuators B, Vol. 48, pp. 362-367, 1998

Examiner Signature Clin Mountain Considered Considered 10 2005

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with M.P.E.P. § 609. Draw line through citation if not in

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